

**CLAIM AMENDMENTS**

This listing of claims will replace all prior versions and listings of claims in the application.

**Listing of Claims**

1-35. (Canceled)

36. (Currently Amended) A method of accessing ~~the~~ a transport header of packets having extension headers, wherein the packets belong to a particular traffic flow, the method comprising the steps of:

(a) reading header information from the packets;

~~and, if said packet includes extension headers,~~

building a cache key from said header information;

(b) using said cache key to perform a cache lookup;

adding an unpredictable flow mark to the particular traffic flow when said extension headers are constantly changing;

(c) if when the particular traffic flow has the unpredictable flow mark no extension header data is found in a cache, performing a serial traversal of said extension headers; and

13        when the particular traffic flow does not have the unpredictable flow mark,  
14 storing data read from said extension headers in said cache; and  
15        ~~(d) if~~ when extension header data ~~is~~ are found in said cache, using said  
16 extension header data to load said extension headers in parallel in order to reduce a  
17 time required to traverse said extension headers.

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1        37.    (Currently Amended) The method defined in claim 36, wherein the ~~packet is~~  
2 packets are an IPv6 packet packets.

1        38.    (Currently Amended) The method defined in claim 36, further comprising:  
2 wherein  
3        building said cache key is built from two fields of the an Internet header of  
4 the packet packets.

1        39.    (Currently Amended) The method defined in ~~claim 36~~ claim 38, wherein:  
2        the two fields used to build the cache key are an IP source address field and a  
3 flow label field for packets that have a flow label, and  
4        an IP source field and a destination address field for packets that do not have  
5 a flow label.

1 40. (Currently Amended) The method defined in claim 36, wherein the cache key  
2 is built from a source address, a flow label, and a next header for a packet that has  
3 a flow label, or from a source address, ~~and a destination addresses-address~~, and a  
4 next header for a packet that does not have a flow label.

1 41. (Currently Amended) The method defined in claim 36, further comprising:  
2 ~~wherein~~  
3 performing the cache lookup ~~is performed~~ using a table containing lengths of  
4 said extension headers.

1 42. (Currently Amended) The method defined in claim 36, wherein said extension  
2 headers include a first extension header and additional extension headers, and  
3 further comprising:  
4 reading ~~where~~ said first extension header ~~is read~~ while said cache lookup is  
5 being performed on said additional extension headers.

1 43. (Currently Amended) The method defined in claim 36, further comprising:  
2 ~~the step of,~~  
3 ~~if~~ when a subsequent packet has a same cache key but additional extension  
4 headers, serially traversing said additional extension headers and updating said  
5 extension header data by storing additional extension header data.

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1 44. (Currently Amended) The method defined in claim 36, further comprising:  
2 ~~the step of~~  
3 ~~detecting whether a packet includes the~~ packets include hop-by-hop and  
4 routing extension headers ~~and omitting steps (c) and (d) if said hop-by-hop and~~  
5 ~~routing extension headers are detected.~~

1  
1 45. (Currently Amended) The method defined in claim 36, further comprising:  
2 ~~wherein if~~ when a subsequent packet has a same cache key as a packet for  
3 which extension header data ~~is~~ are stored in said cache but the extension header  
4 data ~~does~~ do not match extension headers in the subsequent packet, ~~skipping step~~  
5 ~~(d) and instead performing~~ a serial traversal of said extension headers in the  
6 subsequent packet.

1 46. (Canceled)

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1 47. (New) A method of accessing a transport header of packets having extension  
2 headers, wherein the packets belong to a particular traffic flow, the method  
3 comprising:

4 reading header information;  
5 building a cache key from said header information;  
6 using said cache key to perform a cache lookup;  
7 adding an unpredictable flow mark to the particular traffic flow when said  
8 extension headers are constantly changing;

9 when extension header data are not found in a cache:  
10 incrementing a cache failure count,  
11 performing a serial traversal of said extension headers, and  
12 storing data read from said extension headers in said cache when said  
13 cache failure count exceeds a predetermined threshold and the particular  
14 traffic flow does not have the unpredictable flow mark; and  
15 when extension header data are found in said cache, using said extension  
16 header data to load said extension headers in parallel in order to reduce a time

17 required to traverse said extension headers, when the particular traffic flow does  
18 not have the unpredictable flow mark.

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1 48. (New) A method of accessing a transport header of packets having extension  
2 headers, wherein the packets belong to a particular traffic flow, the method  
3 comprising:

4 reading header information;  
5 building a cache key from said header information;  
6 using said cache key to perform a cache lookup;  
7 adding an unpredictable flow mark to the particular traffic flow when said  
8 extension headers are constantly changing;

9 classifying the packets while verifying that cached protocol information  
10 matches the packets;

11 when said verifying fails, performing said classifying again with information  
12 from an upper-layer header of the packets;

13 when no extension header data are found in a cache, performing a serial  
14 traversal of said extension headers, and storing data read from said extension  
15 headers in said cache when the particular traffic flow does not have the  
16 unpredictable flow mark; and

17           when extension header data are found in said cache, using said extension  
18 header data to load said extension headers in parallel in order to reduce a time  
19 required to traverse said extension headers when the particular traffic flow does not  
20 have the unpredictable flow mark.